

We claim:

- 5 1. A process for preparing chlorine from hydrochloric acid, which comprises the steps:
- a) providing a hydrochloric acid feed stream I;
- 10 b) providing a hydrochloric acid recycle stream II;
- c) separating off a hydrogen chloride stream IV from the hydrochloric acid feed stream I and the hydrochloric acid recycle stream II in a distillation step;
- 15 d) feeding the hydrogen chloride stream IV, an oxygen-containing stream V and, if desired, an oxygen-containing recycle stream Va into an oxidation zone and oxidizing hydrogen chloride to chlorine in the presence of a catalyst to give a product gas stream VI comprising chlorine, unreacted oxygen, unreacted hydrogen chloride and water vapor;
- 20 e) separating off hydrogen chloride and water from the product gas stream VI in an absorption step to give a gas stream VII and the hydrochloric acid recycle stream II;
- 25 f) if desired, drying the gas stream VII;
- g) separating off an oxygen-containing stream from the gas stream VII and, if desired, recirculating at least part of this as oxygen-containing recycle stream Va to the oxidation zone, leaving a chlorine-containing product stream VIII;
- 30 h) if desired, further purifying the chlorine-containing product stream VIII.
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2. A process as claimed in claim 1, wherein the hydrochloric acid feed stream I is obtained by
- 5 a1) preparing a feed gas stream Ia which comprises hydrogen chloride and may contain secondary constituents which are not soluble in water;
- a2) absorbing hydrogen chloride in water in an absorption step to give the hydrochloric acid feed stream I and possibly an offgas stream III comprising impurities which are not soluble in water.
- 10 3. A process as claimed in claim 1 or 2, wherein the feed gas stream Ia comprising hydrogen chloride is obtained as offgas stream in (1) isocyanate production from phosgene and amines, (2) acid chloride production, (3) polycarbonate production, (4) preparation of vinyl chloride from ethylene dichloride and/or (5) chlorination of aromatics.
- 15 4. A process as claimed in any of claims 1 to 3, wherein, in the distillation step c), the hydrochloric acid stream II is fractionated in a first substep c1) to give a hydrogen chloride stream IV and an azeotropic hydrochloric acid stream IIa and the azeotropic hydrochloric acid stream IIa is fractionated in a second substep c2) to give a water vapor stream IX and a hydrochloric acid stream IIb which has a concentration higher than that of IIa and the hydrochloric acid stream IIb is recirculated to the substep c1), with the first substep c1) being carried out at a higher pressure than the second substep c2).
- 20 5. A process as claimed in claim 4, wherein the pressure in the first substep is from 1 to 20 bar.
- 25 6. A process for preparing organic isocyanates, which comprises the steps
- 30 i) providing a feed gas stream X comprising carbon monoxide, a chlorine-containing recycle stream VIII and, if desired, a chlorine-containing supplementary stream VIIIa;
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- 5 ii) reacting the streams X, VIII and, if used, VIIIa in a phosgene synthesis step to give a phosgene-containing gas stream XI;
- iii) reacting the phosgene-containing gas stream XI with or more primary amines in an isocyanate synthesis step to form the corresponding isocyanate(s) and hydrogen chloride and give a gas stream XII comprising hydrogen chloride and unreacted phosgene and an isocyanate-containing product stream XIII;
- 10 iv) fractionating the gas stream XII comprising hydrogen chloride and unreacted phosgene in a fractionation step to give a gas stream Ia comprising hydrogen chloride and possibly impurities which are not soluble in water and a phosgene-containing stream XIV, and, if desired, recirculating the phosgene-containing stream XIV to the isocyanate synthesis step iii);
- 15 v) absorbing hydrogen chloride from the gas stream Ia in water in an absorption step to give a hydrochloric acid feed stream I comprising dilute hydrochloric acid and possibly an offgas stream III comprising the impurities which are not soluble in water;
- 20 vi) separating off a hydrogen chloride stream IV from the hydrochloric acid feed stream I and a hydrochloric acid recycle stream II in a distillation step;
- 25 vii) feeding the hydrogen chloride stream IV, an oxygen-containing stream V and, if desired, an oxygen-containing recycle stream Va into an oxidation zone and oxidizing hydrogen chloride in the presence of a catalyst to form chlorine and give a product gas stream VI comprising chlorine, unreacted oxygen, unreacted hydrogen chloride and water vapor;
- 30 viii) separating off hydrogen chloride and water from the product gas stream VI in an absorption step to give a gas stream VII and a hydrochloric acid recycle stream II comprising dilute hydrochloric acid;
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ix) drying the gas stream VII;

x) separating off an oxygen-containing stream from the gas stream VII and, if desired, recirculating at least part of this as oxygen-containing recycle stream Va to the oxidation zone to leave a chlorine-containing product stream VIII;

xi) using the chlorine-containing product stream VIII, if desired after purification, as chlorine-containing recycle stream VIII in step i).

7. A process as claimed in claim 5, wherein, in the distillation step vi), the hydrochloric acid feed stream I and the hydrochloric acid recycle stream II are fractionated in a first substep vi-1) to give a hydrogen chloride stream IV and an azeotropic hydrochloric acid stream IIa and the azeotropic hydrochloric acid stream IIa is fractionated in a second substep vi-2) to give a water vapor stream IX and a hydrochloric acid stream IIb which has a concentration higher than that of IIa and the hydrochloric acid stream IIb is recirculated to the substep vi-1), with the first substep vi-1) being carried out at a higher pressure than the second substep vi-2).